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US EPA RECORDS CENTER REGION 5



454211

DECLARATION

Declaration for the Record of Decision

Site Name and Location

GENERAL MILLS

EAST HENNEPIN AVENUE SITE

2010 EAST HENNEPIN AVENUE

MINNEAPOLIS, MINNESOTA

Statement of Basis and Purpose

This decision document presents the selected remedial action for the **East Hennepin Avenue** site (Site) in **Minneapolis, Minnesota**. The former owner and responsible party for the Site is General Mills, Inc.

The decision described in this document was made in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Minnesota Environmental Response and Liability Act (MERLA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this Site.

The United States Environmental Protection Agency (EPA) concurs with the selected remedy. The information supporting this remedial action decision is contained in the Administrative Record for the Site.

Assessment of the Site

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present a threat to the environment.

Description of the Selected Remedy

The selected remedy is an expansion of the existing ground water pump out system at the Site. Specifically, the remedy calls for installation of two additional ground water extraction wells into the Magnolia aquifer beneath the Site. The wells are designed to extract approximately 200 gallons of contaminated water per minute. The primary function of these wells is to extract contaminated water to prevent its migration off-site or into underlying aquifers. The extracted water, although relatively low in contaminants, will receive passive treatment as it is conveyed through the Minneapolis storm sewer system prior to discharge into the Mississippi River. The selected remedy will need to remain in place until a significant reduction in contamination occurs.

Declaration of Statutory Determinations

The selected remedy protects human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The remedy utilizes

permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment to reduce toxicity, mobility, or volume as their principal element.

In accordance with standard procedures, a review will be conducted within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Charles W. Williams
MPCA Commissioner

Date

DECISION SUMMARY

Decision Summary for the Record of Decision

Introduction

The subject of this Record of Decision (ROD) is remedial action at the East Hennepin Avenue site (Site), formerly owned by General Mills, Inc. (GMI). Much of the remedial action required at the Site was completed several years ago. All such actions were performed in accordance with a Consent Order signed by GMI and the Minnesota Pollution Control Agency (MPCA) on October 23, 1984.

This ROD describes an additional remedial action to be implemented at the Site. This action is also being initiated in response to provisions in the Consent Order. Specifically, the need for this action arose when contaminant levels at the Site exceeded a trigger level established in the Consent Order.

The Consent Order dictates that the appropriate response to this exceedance is a remedial action that is conceptually similar to those previously initiated at the Site. This necessarily restricts the scope and number of alternatives presented in this ROD to a smaller group than would normally be considered.

RECORD OF DECISION
DECISION SUMMARY
GENERAL MILLS
EAST HENNEPIN AVENUE SITE
2010 EAST HENNEPIN AVENUE
MINNEAPOLIS, MINNESOTA

1. Site Name, Location, and Description

The East Hennepin Avenue site (Site), formerly owned by General Mills, Inc. (GMI), is located at 2010 East Hennepin Avenue in the northeastern outskirts of Minneapolis, Minnesota (Figure 1). Although land use near the facility is predominantly industrial/commercial, residential areas are found within a block of the Site's southern boundary.

2. Site History and Enforcement Activities

GMI owned and operated a technical research facility at the Site from 1930 to 1977. Food research was the primary activity at the facility through 1947, when chemical research also began.

According to former GMI employees, laboratory solvent associated with the facility's chemical research activities was discharged into a soil absorption pit system located in the southeastern portion of the Site. The system allegedly consisted of a series of three stacked, perforated, 55-gallon drums buried 10-12 feet beneath the soil surface. GMI estimated up to a thousand gallons of solvent was discharged into the pit annually, and that this activity took place from 1947 to 1962.

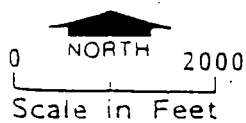
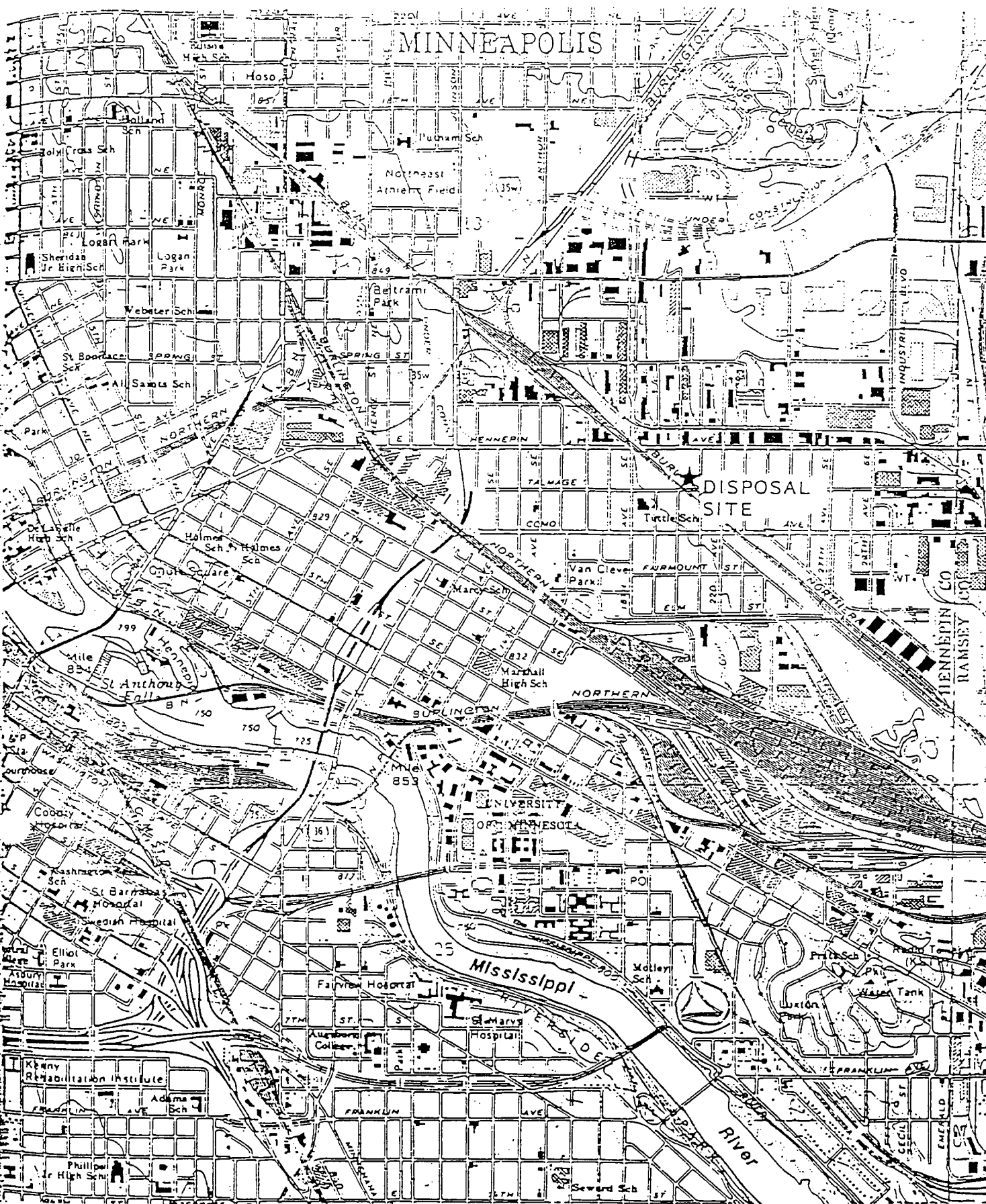


Figure 1

LOCATION OF DISPOSAL SITE

On June 12, 1981, GMI notified the Minnesota Pollution Control Agency (MPCA) of the existence of the soil absorption pit system, and their intention to investigate the Site. Since that time, GMI has cooperated with the MPCA to examine and remediate the environmental problems associated with their facility, although they no longer own or occupy the property at 2010 East Hennepin Avenue.

Analyses of the soils and ground water near the soil absorption pit system showed the presence of benzene; toluene; xylene; methyl isobutyl ketone; ethylbenzene; methylene chloride; 1,1,1 trichlorethane; 1,1,2,2 tetrachlorethane; 1,1,2 trichlorethane; 1,1,2,2 tetrachloroethylene; chlorobenzene; and trichloroethene. These compounds are hazardous substances, pollutants, or contaminants within the meaning of Minn. Stat. § 115B.02, subds. 8 and 13.

Samples from three of eleven soil borings drilled at the Site in 1981 exhibited significant VOC contamination. Additional investigations were conducted in 1983 to better define the degree and extent of soil contamination at the Site. Three additional borings were drilled in areas that exhibited significant contamination in 1981 (Figure 2). Only one of these borings produced soil samples exhibiting significant VOC contamination.

At this time GMI performed the equivalent of a feasibility study entitled "Summary of Alternative Remedial Actions". Among the remedial alternatives considered for the site in that document or subsequent correspondence were:

TABLE 1
VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES
(concentrations in mg/kg)

Boring Number	1	2						3	
Sampling Date	6/2/81	6/2/81						6/2/81	
Sample Depth (feet)	14.5-16	0-1.5	4.5-6	9.5-11	14.5-16	19.5-21	24.5-26	14.5-16	19.5-21
Benzene	*	*	*	26	46	97	97	37	89
Chloroform	*	1	6	7	2	280	280	2	220
Tetrachloroethylene	-	-	-	-	-	-	-	-	-
Toluene	*	*	*	4	87	91	91	79	89
1,1,1-Trichloroethane	*	*	*	3	1	730	730	1	780
Trichloroethylene	*	*	*	5	3	81	82	1	110
Xylenes	<u>*</u>	<u>*</u>	<u>*</u>	<u>20</u>	<u>35</u>	<u>87</u>	<u>87</u>	<u>18</u>	<u>95</u>
Sum	*	1	6	65	170	1400	1400	140	1400

* Below detection limit.

- Not analyzed.

TABLE 1 (cont.)
VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES
(concentrations in mg/kg)

Boring Number	4		5		6	7	8	9
Sampling Date	6/3/81		6/3/81		6/4/81	6/5/81	6/5/81	6/5/81
<u>Sample Depth (feet)</u>	<u>14.5-16</u>	<u>19.5-21</u>	<u>14.5-16</u>	<u>19.5-21</u>	<u>14.5-16</u>	<u>14.5-16</u>	<u>14.5-16</u>	<u>14.5-16</u>
Benzene	9	14	*	*	*	*	*	*
Chloroform	2	2	*	*	*	*	*	*
Tetrachloroethylene	-	-	-	-	-	-	-	-
Toluene	90	17	*	*	*	*	*	*
1,1,1-Trichloroethane	1	3	2	*	*	*	*	*
Trichloroethylene	3	5	*	*	*	*	*	*
Xylenes	<u>16</u>	<u>58</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>
Sum	120	100	2	*	*	*	*	*

* Below detection limit.

- Not analyzed.

TABLE 1 (cont.)
VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES
(concentrations in mg/kg)

Boring Number	10		11	101					
Sampling Date	6/5/81		6/5/81	3/25/83					
Sample Depth (feet)	14.5-16	19.5-21	14.5-16	15-17	20-22	25-27	30-32	35-37	42-44
Benzene	*	*	*	*	*	*	*	*	*
Chloroform	*	*	*	2	*	*	*	*	*
Tetrachloroethylene	-	-	-	*	*	*	*	*	*
Toluene	*	1	*	*	*	*	*	*	*
1,1,1 Trichloroethane	*	*	*	*	*	*	*	*	*
Trichloroethylene	*	*	*	*	*	*	*	*	*
Xylenes	<u>*</u>	<u>*</u>	<u>*</u>	<u>4</u>	<u>*</u>	<u>*</u>	<u>1</u>	<u>*</u>	<u>*</u>
Sum	*	2	*	9	<1	3	1	1	1

* Below detection limit.

- Not analyzed.

TABLE 1 (cont.)
VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES
(concentrations in mg/kg)

Boring Number	102						106
Sampling Date	3/28/83						3/28/83
Sampling Depth (feet)	15-17	20-22	25-27	30-32	35-37	40-42	20-22
Benzene	*	*	*	*	*	*	39
Chloroform	*	*	*	*	*	*	380
Tetrachloroethylene	*	*	*	*	*	*	20
Toluene	*	*	*	*	*	*	100
1,1,1 Trichloroethane	*	*	*	*	*	*	*
Trichloroethylene	*	*	*	*	*	*	260
Xylenes	*	*	*	*	*	*	39
Sum	<1	3	<1	<1	1	<1	830

* Below detection limit.

- Not analyzed.

1. No action
2. Excavation of contaminated soils in the vadose zone
3. 45-foot diameter excavation of contaminated soils to a depth of 30 feet (vadose and saturated zone)
4. 70-foot diameter excavation of contaminated soils from to a depth of 30 feet (vadose and saturated zone)
5. Venting of the vadose zone in conjunction with a ground water pump out system
6. Ground water pump out system
7. Slurry wall and cap
8. Soil washing in conjunction with a ground water pump out system

All the remedial action options except the ground water pump out system were ultimately rejected because they were not "cost effective". The basis for this conclusion was that implementation of the rejected options would not eliminate the need for, or significantly reduce the operating time for a ground water pump out system. From this point forward, environmental problems at the Site were considered to be more appropriately addressed through ground water rather than surface soil remediation.

On October 23, 1984, GMI and the Minnesota Pollution Control Agency (MPCA) signed a Consent Order. The Consent Order has guided all the remedial activities undertaken at the Site to date, and established the trigger level which is the basis for the action described in this ROD.

Through the Consent Order, significant ground water remedial actions were initiated at the Site in 1985. These actions are fully described in Section 4.

3. Highlights of Community Participation

The MPCA made a substantial effort to encourage community participation and solicit public opinion regarding the remedy that is the subject of this ROD. A fact sheet proposed plan describing the remedy was released to the public for comment in July, 1991. The formal public comment period extended between August 2 and September 2, 1991.

A public meeting was also held at the Van Cleve Community Center in Minneapolis August 7, 1991. At this meeting, representatives of the MPCA answered questions about the Site and the proposed remedial action.

Responses to the comments received during the public comment period are included in the Responsiveness Summary, which is a part of this ROD.

4. Scope and Role of the Response Action Within Overall Site Strategy

The remedy described in this ROD complements the existing ground water remediation system in addressing the environmental problems at the Site. The remedial strategy at the Site involves the containment and treatment of contaminated ground water that may pose a threat to the environment.

Two aquifers underlying the Site are pertinent to the current remediation efforts; the surface or glacial drift aquifer and the Platteville formation (Carimona and Magnolia Members) (Figure 3).

The existing ground water extraction wells at the Site include the downgradient glacial drift pump out wells (#111, #112, #113), the site glacial drift pump out wells (#109 and #110), and the site Carimona pump out well (#108). Well locations in the glacial drift, Carimona, and Magnolia aquifers are illustrated in Figures 4-6, respectively.

The downgradient glacial drift pump out wells were designed to contain and remove ground water with trichloroethene (TCE) concentrations exceeding 270 ug/L from the glacial drift aquifer. Ground water extracted by these wells receives passive treatment in the Minneapolis storm sewer network on its way to a discharge point in the Mississippi River. The downgradient glacial drift pump out wells began operation December 5, 1985.

The site glacial drift pump out wells were designed to contain and remove ground water with TCE concentrations exceeding 270 ug/L from the glacial drift aquifer. The site Carimona pump out well was designed to contain and remove ground water with TCE concentrations exceeding 27 ug/L from the Carimona Member of the Platteville formation.

Ground water removed by the site glacial drift pump out wells and the site Carimona pump out well is treated by an air stripping tower. Effluent from the air stripper is discharged to the Minneapolis storm sewer network. The tower is designed to remove 99 percent of the volatile organic compounds from influent ground water at a rate of 150 gallons per minute (gpm). The site glacial drift ground water and Carimona pump out wells began operation November 1, 1985.

The National Pollutant Discharge Elimination System (NPDES) permit for the tower discharge requires the treated ground water to contain less than 50 ug/L of TCE based on an annual average, and less than 100 ug/L of TCE as a daily maximum. The tower discharge has exceeded the NPDES permit limit on only one occasion, and this resulted from system failure rather than inadequate operation and maintenance on the part of GMI.

The remedy described in this ROD is a logical extension of the existing ground water pump out system, being designed to contain and remove contaminants in ground water from the Magnolia Member of the Platteville formation that may have filtered through the overlying glacial drift or Carimona Member, or migrated horizontally through the Magnolia Member from

an off-site source. Remedial action to address this problem is required by the ground water remedial action plan appended to the Consent Order. It states:

"...if the TCE concentration in ground water drawn from any of the wells in the Magnolia Unit shows a TCE concentration of 27 ug/l or greater, General Mills shall propose by March 1, 1988, remedial actions for the portion of the Magnolia with concentrations in excess of 27 ug/l of TCE for the MPCA Director approval in accordance with the concepts set forth herein for the Carimona, except no water treatment will be required for the Magnolia, pursuant to Part E. of the Order."

Clearly, the decision was made in 1984 to implement a ground water remedy if contaminant levels in the Magnolia Member exceeded the 27 ug/L trigger level. The decision documented in this ROD, therefore, is the selection of a ground water remedy consistent with the provisions of the Consent Order.

5. Summary of Site Characteristics

The contaminated medium of concern at the Site is ground water. Although none of the aquifers currently exhibiting contamination are sources of drinking water in the area, the MPCA is concerned about the spread of contaminants to underlying aquifers that may be used for that purpose. The major contaminant at the Site is TCE. Although other volatile organic compounds (VOCs) were found in trace quantities at the time the Site was initially examined (Section 2), they have never been present in the absence of TCE, or in sufficient quantities to merit individual attention. In fact, concentrations of TCE so overshadowed those of the other contaminants that much of the language in the Consent Order requiring initiation of remedial activities at the Site is based solely upon TCE concentrations.

The compounds found in the ground water at the Site are generally classified as suspected carcinogens. They are heavier than water and, therefore, tend to sink to lower levels within geologic strata. Although these compounds do not completely mix with ground water, a sufficient quantity typically dissolves in ground water to preclude its use as a safe drinking water source.

The soil absorption pit system previously described (Section 3) is the only known source of contamination at the Site. Data from upgradient monitoring wells in the Magnolia aquifer suggest that some of the contamination found beneath the Site in this aquifer is coming from an off-site source yet to be identified. Figures 7-9 present the historical data on the degree and extent of TCE contamination in the glacial drift, Carimona, and Magnolia aquifers.

6. Summary of Site Risks

The only identified health risk at the Site is associated with the potential consumption of ground water contaminated with VOCs, particularly TCE. TCE concentrations above the Minnesota Department of Health's (MDH) Recommended Allowable Level (RAL) of 30 ug/L have been routinely detected in the glacial drift, the Carimona, and Magnolia aquifers beneath the Site (Figures 7-9).

MDH RALs for known or possible carcinogens such as TCE are derived from a quantitative estimate of the compound's carcinogenic potency, published by EPA's Carcinogen Assessment Group. The RALs for carcinogens are calculated so exposure to the contaminant in drinking water results in a lifetime cancer risk below 1 in 100,000 (1×10^{-5}).

Fortunately, contaminated ground water at the Site poses no immediate threat to human health, since the contaminated aquifers are not used as a drinking water source. Nevertheless, there is concern that this contamination, if left unchecked, may spread into underlying aquifers.

Because of this concern, it is clear that actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present a threat to the environment.

7. Description of Alternatives

The remedial alternatives considered for implementation at the Site are summarized below. As previously stated, the list of alternatives is brief because of the restrictions on the remedy imposed by provisions in the Consent Order.

ALTERNATIVE 1 - No Action

This alternative provides for no additional action at the Site in response to existing environmental conditions. Under this scenario, the ground water pump out system in place at the Site will continue to operate, and will be monitored in accordance with the Consent Order and subsequent agreements between GMI and the MPCA.

ALTERNATIVE 2 - Single Magnolia Aquifer Pump Out Well

This alternative involves expansion of the existing Site ground water pump out system to include a single Magnolia aquifer extraction well. Like the existing Site pump out system, the Magnolia extraction well will be designed to capture and treat TCE contaminated water that might otherwise migrate into underlying aquifers.

This alternative involves construction of two wells in the Magnolia aquifer. Pump tests will be conducted on these wells to evaluate the hydraulics of the well/aquifer system. After the pump test data are analyzed, one of the wells will be selected as the extraction well, and the other will be kept as a monitoring well. The Magnolia extraction well will be 6 inches in diameter, approximately 70 feet deep, and will be designed to remove about 100 gallons of water per minute.

The Consent Order specifically states that treatment is not required on the water to be extracted from the Magnolia aquifer. Nevertheless, the extracted water will receive passive treatment in the Minneapolis storm

sewer network prior to discharge into the Mississippi River. This is the same treatment applied to the ground water currently extracted from the downgradient glacial drift extraction wells (#111, #112, and #113).

NPDES permit #MN 0056022 regulates the discharges from the Site ground water pump out system. This permit will be amended and reissued to include provisions for the new discharge associated with the Magnolia pump out well. NPDES permit limits constitute the applicable or relevant and appropriate requirements (ARARs) for purposes of this remedial alternative. The current TCE discharge limits in NPDES permit #MN 0056022 are 50 ug/L as an annual average, and 100 ug/L as a daily maximum in the effluent from the Site air stripper. These limits have recently been reviewed and upheld by the MPCA's Division of Water Quality.

The projected capital cost of the Magnolia pump out system is \$80,000. Operation and maintenance costs for the system are estimated at \$6,000 - \$8,000 per month. These figures were provided by Barr Engineering Company, consultants to GMI.

ALTERNATIVE 3 - Dual Magnolia Aquifer Pump Out Wells

Like Alternative 2, this alternative also involves expansion of the existing Site ground water pump out system. However, in this case, two extraction wells will be placed in the Magnolia aquifer. Like the existing pump out system, these wells will be designed to capture and treat TCE contaminated water that might otherwise migrate into underlying aquifers.

Recall that under Alternative 2, two wells were drilled into the Magnolia aquifer. Based on pump test results, one of these would be selected as the extraction well, and the other would remain as a monitoring well. Under this Alternative, both wells would be used as extraction wells. The wells will be 6 inches in diameter, approximately 70 feet deep, and will each be designed to remove approximately 100 gallons of water per minute.

As in Alternative 2, water extracted from these wells will also be discharged to the Minneapolis storm sewer network for passive treatment prior to discharge into the Mississippi River, and this discharge would also be regulated under amended NPDES permit #MN 0056022.

The projected capital cost of the dual Magnolia pump out system is \$120,000. Operation and maintenance costs for the system are projected to vary between \$8,000 and \$12,000 per month.

8. Summary of Comparative Analysis of Alternatives

The following section evaluates the alternatives considered for implementation at the Site with respect to the nine criteria defined in 40 CFR Part 300, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), dated March 8, 1990. The alternatives are defined as follows:

Alternative 1 - No Action

Alternative 2 - Single Magnolia Aquifer Pump Out Well

Alternative 3 - Dual Magnolia Aquifer Pump Out Wells

A. Overall Protection of Human Health and the Environment

Alternatives 2 and 3 protect human health and the environment by containing contaminants within the boundaries of the ground water treatment system. This eliminates significant migration of contaminated ground water into underlying aquifers.

The additional pump out well that will be installed under Alternative 3 provides significant advantages over Alternative 2. The major affect is an increase in the capture zone at the Site, which provides additional assurance that contaminated ground water will not move into other aquifers.

Moreover, a pump out well failure would completely eliminate the effectiveness of Alternative 2. Under Alternative 3, however, a pump out well failure is far less critical, since the remaining well would remain operational, and its flow rate might even be adjusted to compensate for the failure of the other well.

The No Action alternative does not protect the environment beyond the level of protection provided by the existing ground water pump out system.

B. Compliance with ARARs.

The ARARs for this Site are represented by the terms and conditions of NPDES permit #MN0056022, which regulates the discharge from the existing ground water pump out system at the Site. This permit will be amended to accommodate an additional outfall should the ground water pump out system be expanded by one or more wells. The MDH drinking water RAL of 30 ug/L for TCE also represents a "to be considered" ARAR at this Site.

Since the existing ground water pump out system has a history of compliance with the conditions imposed by NPDES permit #MN0056022, there is no reason to suspect the expanded systems described under Alternatives 2 and 3 will experience any difficulty maintaining this record. Further, Alternatives 2 and 3 are designed to restrict off-site movement of ground water with TCE concentrations exceeding 27 ug/L, which is lower than the MDH RAL of 30 ug/L.

The No Action alternative will result in no change to the existing ground water pump out system, which is in compliance with ARARs. However, it will also provide no additional protection against the movement of TCE-contaminated ground water from the Site.

C. Long-Term Effectiveness and Permanence

None of the remedial alternatives considered here truly qualifies as a permanent remedy. Alternatives 2 and 3 represent viable long-term solutions to the Site ground water contamination problems based on experience at this and other sites in Minnesota. Unfortunately, these alternatives involve the long-term operation and maintenance of the ground water pump out system.

The No Action alternative is neither effective in the long-term or permanent.

D. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 2 and 3 reduce the toxicity, mobility, and volume of contaminants by containing the contaminated ground water within the boundaries of the treatment system, and removing and treating contaminated water migrating from the Site. Alternative 3, however, will do so more quickly and efficiently using the expanded capture zone associated with a dual rather than a single pump out well.

The No Action alternative does nothing to further reduce the toxicity, mobility, or volume of contaminants.

E. Short-Term Effectiveness

Although Alternatives 2 and 3 are long-term ground water remediation solutions, they are also effective in the short-term because they require only a few weeks for installation, and are immediately functional thereafter.

The No Action alternative is not effective in the short-term.

F. Implementability

Since the No Action alternative requires no additional activity at the Site, no problems with implementability will occur.

Past experience in the construction and use of ground water pump out technology at this Site suggests that Alternatives 2 and 3 could be implemented at this Site without serious difficulty. It is apparent, however, that installation and maintenance of the single extraction well described under Alternative 2 would be easier than for the dual extraction wells described under Alternative 3.

G. Cost

Since it requires no action, Alternative 1 is the least expensive remedy proposed.

Alternative 3 obviously involves twice the equipment and more service than Alternative 2. Accordingly, corresponding capital and operational costs for Alternative 3 are projected to be 50 percent more than for Alternative 2.

H. State Acceptance

The State has previously agreed to GMI's implementation of a ground water remedy consistent with provisions in the Consent Order. Therefore, Alternatives 2 and 3 are in principle, both acceptable to the State. However, since it provides for an increased capture zone and provides security against well failure, the State prefers Alternative 3.

The No Action alternative is not acceptable to the State, since the potential movement of TCE contaminated ground water off-site represents an adverse impact on the environment, and No Action is not an acceptable response to the Consent Order.

The EPA concurs with the State's position.

I. Community Acceptance

Interest and concern on the part of the community has been minimal, as indicated by the low attendance at the Public Meeting of August 7, 1991, and the few comments received from the public which are included in the attached Responsiveness Summary. Based on this apparent lack of interest or concern, it is difficult to determine which Alternative is preferred by the community.

Figure 10 summarizes the results of the alternatives analysis. The alternative receiving the highest rank score within each criterion represents the optimal remedy for that criterion. The alternative receiving the largest number of total rank points represents the best overall remedy, provided the remedy meets the primary criteria in accordance with the NCP.

9. Selected Remedy

The selected remedy is Alternative 3, expansion of the existing ground water pump out system by a dual pump out system.

Figure 10.

COMPARISON OF ALTERNATIVES

Alternative 1: No Action

Alternative 2: Single Magnolia Aquifer Extraction Well

Alternative 3: Dual Magnolia Aquifer Extraction Wells

CRITERIA FOR EVALUATION	ALTERNATIVES		
	1	2	3
1 - Protection of Human Health and the Environment	1.0	2.0	3.0
2 - Compliance with ARAR'S	1.0	2.5	2.5
3 - Long-Term Effectiveness	1.0	2.5	2.5
4 - Short-Term Effectiveness	1.0	2.5	2.5
5 - Reduction of Toxicity, Mobility, and Volume	1.0	2.0	3.0
6 - Implementability	3.0	2.0	1.0
7 - Cost	3.0	2.0	1.0
8 - Community Acceptance	2.0	2.0	2.0
9 - State Acceptance	1.0	2.0	3.0
TOTAL RANK POINTS	14.0	19.5	20.5

The primary remediation goal is the containment and treatment of TCE-contaminated ground water to prevent its migration into underlying aquifers.

The anticipated capital cost of this remedy is \$120,000, with operation and maintenance costs of \$8,000 - \$12,000 per month.

10. Statutory Determinations

Protection of Human Health and the Environment

The selected remedy, which is an extension of the existing ground water pump out system at the Site, protects the environment by containing and treating contaminated ground water that might otherwise migrate to underlying aquifers.

A remedy of this general description was identified in the Consent Order as the action to be implemented in the event TCE concentrations in ground water from the Magnolia aquifer exceeded 27 ug/L. Since the current MDH RAL for TCE is 30 ug/L, which represents a 10^{-5} excess cancer risk number, the selected remedy is designed to reduce the risk of exposure to contaminated ground water to at least the 10^{-5} level.

Because the amount of contamination removed by the selected remedy is relatively small, and the discharge from the ground water extraction and treatment system is regulated under NPDES permit #MN0056022, implementation of the selected remedy will not present an unacceptable short-term risk or cause significant cross-media contamination at the Site.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with NPDES permit #MN0056022, which regulates the discharge from the ground water pump out system at the facility. The current TCE discharge limits from the air stripper tower at the Site are 50 ug/L as a monthly average, and 100 mg/L as a daily maximum.

The selected remedy will also restrict off-site migration of ground water with TCE concentrations above the MDH RAL of 30 ug/L, which is a "to be considered" ARAR for this Site.

Cost-Effectiveness

The selected remedy expands upon the existing ground water pump out system that has proven effective in meeting remedial objectives. The capital and long-term costs of the selected remedy are reasonable in terms of the nature of the contamination at the Site.

The decision requiring justification here is the selection of the remedy featuring the dual, rather than the single, ground water extraction wells at the Site. It is necessary to determine if the extent of the contamination in the Magnolia aquifer is sufficiently serious to justify the additional costs and benefits associated with the dual extraction well remedy. Based on the increased capture zone and the security offered by the dual extraction well system, the answer is clearly yes.

Utilization of Permanent Solutions
and Alternative Treatment Technologies to the Maximum Extent Practicable

The nature of the ground water contamination at this Site, which includes the suspected presence of dense, non-aqueous phase liquids (DNAPLs), does not lend itself to permanent remediation. The degree to which DNAPL pockets can be located, isolated, accessed, and treated is sufficiently uncertain that it cannot reasonably be said that remedial efforts at the Site are truly permanent. For this reason, a permanent solution is not practicable at this Site, and the selected alternative is as close to a permanent remedy as is likely to be achieved.

The use of alternative treatment technologies is also not practicable in this situation. In 1984, GMI began to prepare for the possibility that it would be required to implement additional remedial action at the Site in the event the ground water trigger level for TCE would be exceeded. A general description of the remedial action required should this trigger level be exceeded was clearly specified at that time. The MPCA does not believe that now, seven years later, it is reasonable or appropriate to ask GMI to evaluate alternative treatment technologies in the absence of evidence suggesting that such action would markedly improve upon the remedial action previously agreed upon by the MPCA and GMI.

The selected remedy fully meets the NCP's primary criteria of protecting human health and the environment and compliance with ARARs. It is also a remedy that is consistent with the type of action that was mutually agreed upon by the

MPCA and GMI in 1984 and, in the absence of sound information indicating another course of action should be taken, it is to the advantage of all parties to proceed along familiar ground.

Although the MPCA has afforded the public an opportunity to voice its opinion regarding the selected remedy, it should be noted that the public has expressed little interest in the Public Notice or other matters associated with the disposition of the Site.

Preference for Treatment as a Principal Element

The selected remedy satisfies the preference for treatment by utilizing the Minneapolis storm sewer system as a unit for the passive treatment of TCE-contaminated ground water extracted from the Magnolia aquifer. It is noteworthy that this level of treatment occurs despite specific conditions in the Consent Order indicating treatment is not required on ground water extracted from the Magnolia aquifer.

RESPONSIVENESS SUMMARY

Responsiveness Summary for the Record of Decision

This community responsiveness summary has been developed to document the Minnesota Pollution Control Agency's (MPCA) response to comments received in regard to a proposed expansion of the ground water pumpout system at the General Mills East Hennepin Avenue site (Site) in northeast Minneapolis, Minnesota, formerly owned by General Mills, Inc.

1. Overview

The MPCA's recommended expansion of the ground water cleanup was announced to the community through a news release to local newspapers, a legal notice in the local newspaper of record, and a fact sheet mailed to all interested parties. The recommended expansion would consist of two additional ground water extraction wells in the Magnolia aquifer. This well would complement the ground water pumpout system that has been operating on the site since 1985.

Only two substantive comments were received during the public meeting on the proposed expansion of the remedy (held August 7, 1991). The comments received are summarized below, along with the MPCA's responses.

2. Summary of Comments Received and MPCA Responses

Comment: A citizen at the public meeting asked if contaminants in the aquifers beneath the site are continuing to move downward, and if so, would that necessitate further (deeper) expansion in the future.

MPCA response: At present, contaminants are continuing to migrate downward from the surficial and Carimona aquifers into the Magnolia aquifer. Our recognition of this problem has resulted in the current proposal to expand the ground water recovery system at the Site.

The MPCA anticipates this expansion will prevent further downward migration of contaminants. The expanded system will be evaluated in the future to determine if the system expansion has proven effective, or if additional remedial action will be required in the future.

Comment: Two citizens at the public meeting asked if the proposed expansion required a National Pollutant Discharge Elimination System (NPDES) permit, and if so, would the public be notified and have an opportunity for comment before such permit is issued.

MPCA's response: The expansion would require an NPDES permit amendment. Normally, notice of such permit amendments is given in the State Register and the newspaper of record in the community where the facility is located. However, the MPCA recognizes that such notices may be overlooked by members of the public who may wish to comment. Therefore, the MPCA will mail NPDES permit amendment notices for this expansion to those attending the public meeting and to any other party who asks to receive notice.